Harvatek Surface Mount LED Data Sheet
HT-T169TW-5607

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1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, and (c) whose failure to perform when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in a significant injury of the user.

2. A critical component in any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

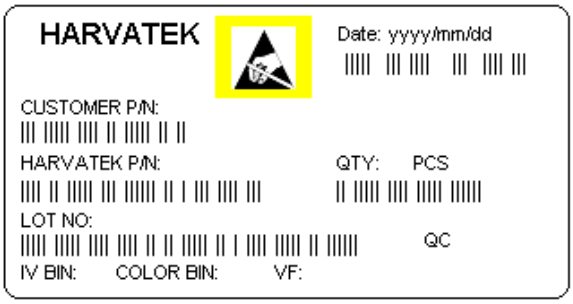
Product Specifications

Product	Emission Color	Technology	Test Current I_F (mA)	Luminous Intensity I_V (mcd)	Orderable Part Number
HT-T169TW-5607	White	InGaN	20	1800 min	HT-T169TW-5607

Compliance and Certification

RoHS compliant and IS9002, QS9000 and ISO14001 certified.

Label Specifications



■ Harvatek P/N:

H T - T 1 6 9 TW - xxxx

Series Name	Emitting Color	Customer Code
HT-T169 HT: Harvatek T169: tLED series 3.5 (L) x 2.7 (W) x 1.8 (H) mm	TW TW: White @ 20mA	TBD Customer Product Code

Lot No.:

1	2	3	4	5	6	7	8	9	10
P	1	2	2	3	0	A	-	D	T

Code 1	Code 2	Code 3	Code 4, 5	Code 6, 7	Code 9	Code 10
	Mfg. Year	Mfg. Month	Mfg. Date	Lots	Resin Color	Packaging
Internal Tracing Code	Z: 2000 1: 2001 2: 2002 3: 2003 …..	1: Jan. 2: Feb. …. 9: Sep. A: Oct. B: Nov. C: Dec.	1~31/ (30)	01~99, A,B,C…	C: Clear D: Diffused	T: Tape & Reel

■ Luminous Intensity (Iv) Bin:

Bin	Luminous Intensity Range (mcd)	
	Minimum	Maximum
AB1	1800	2010
AB2	2010	2250
AC1	2250	2530
AC2	2530	2850

Tolerance: ± 10%, 20mA

■ Forward Voltage (V_F) Bin:

Forward Voltage Range (V)		
Bin	White (TW)	
	Min	Max
H7	2.9	3.1
H8	3.1	3.3
J7	3.3	3.5
J8	3.5	3.7
K7	3.7	3.9

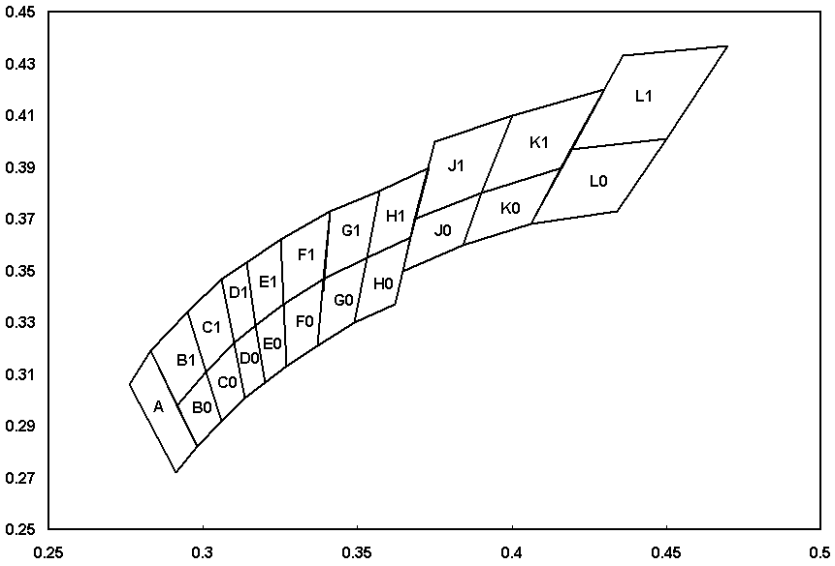
Tolerance: ± 0.05 V, 20mA

■Correlated Color Temperature

Color	Condition	Bin Code	Min.	Typ.	Max.	Unit
Warm White	I_F=150mA	K1	3,250	3,500	3,750	K
		K0	3,250	3,500	3,750	
		J1	3,750	4,000	4,250	
		J0	3,750	4,000	4,250	

Note: It maintains a tolerance of ± 5% on CCT

Correlated Color Temperature and Chromaticity Correlation



Product Characteristics

Absolute Maximum Ratings

Product	Emission Color	P_d (mW)	I_F (mA)	I_{FP}* (mA)	V_R (V)	T_{OP} (°C)	T_{ST} (°C)
HT-T169TW-5607	White	74	20	200	5	-40°C~+100°C	-40°C~+100°C

* Condition for I_{FP} is pulse of 0.005 duty and 0.01msec width

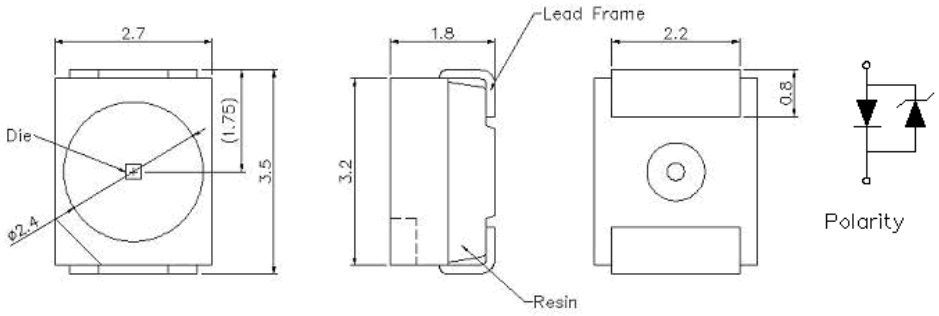
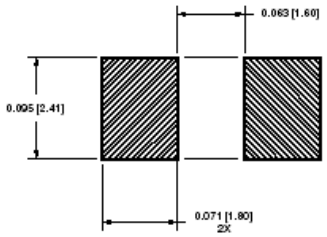
Electro-Optical Characteristics

T_a 25 °C

Product	Emission Color	If(mA)	V_F(V)		CCT (K)		I^*_V(mcd)
			typ	max	min	max	Typ
HT-T169TW-5607	White	20	3.3	3.9	3250	4250	1800

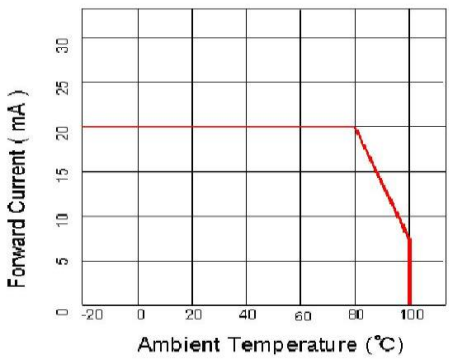
Package Outline Dimension
Recommended Soldering Pattern for Reflow Soldering

Unit: mm Tolerance: +/-0.1

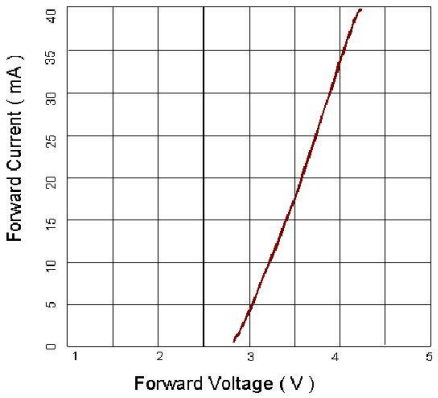
Outline Dimension	Solder Pattern
	
Soldering terminals may shift in the x, y direction.	Unit: mm

Characteristic Curves for TW

Forward Current vs. Ambient Temperature

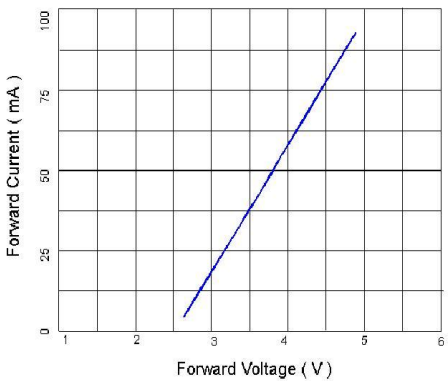


Forward Voltage vs. Forward Current

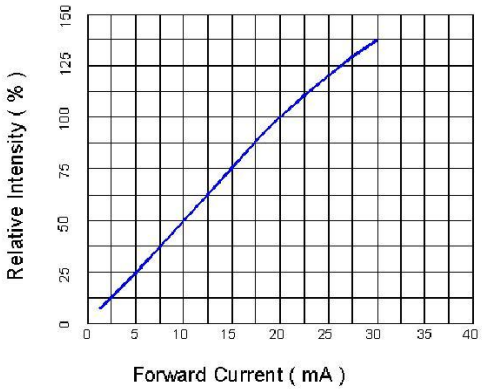


Peak Forward Voltage vs. Forward Current

100's test pulse, 1% duty cycle

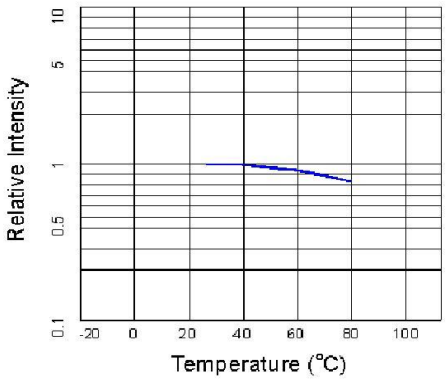


Relative Intensity vs. Forward Current

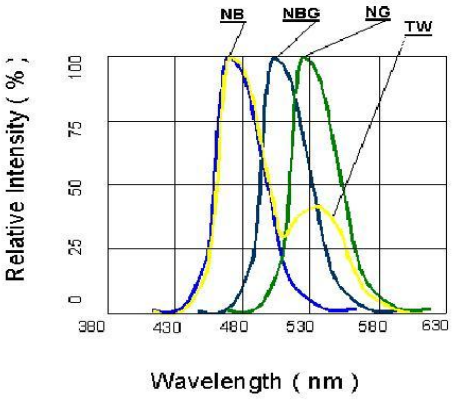


Relative Intensity vs. Ambient Temperature

Plused 20mA; 300us pulse, 10ms period

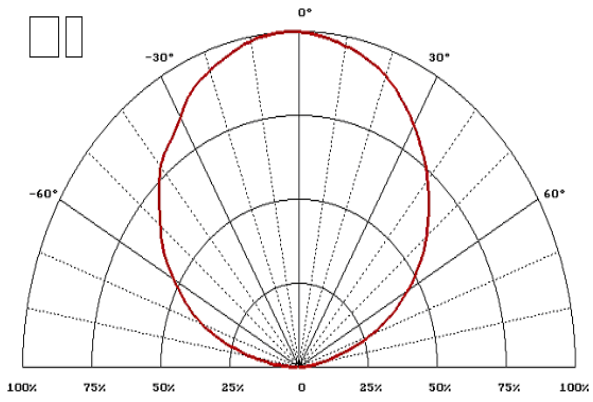


Relative Intensity vs. Wavelength

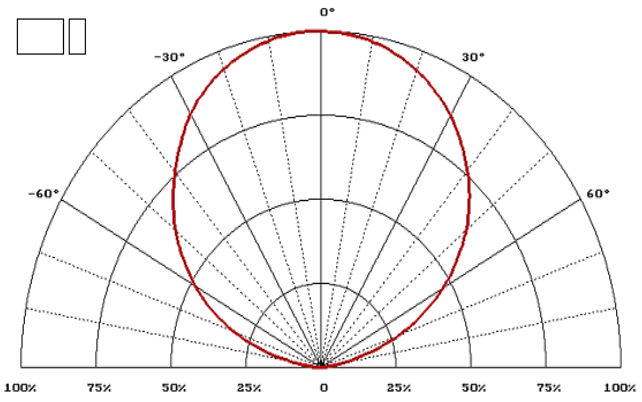


Radiation Pattern

Directive Characteristics

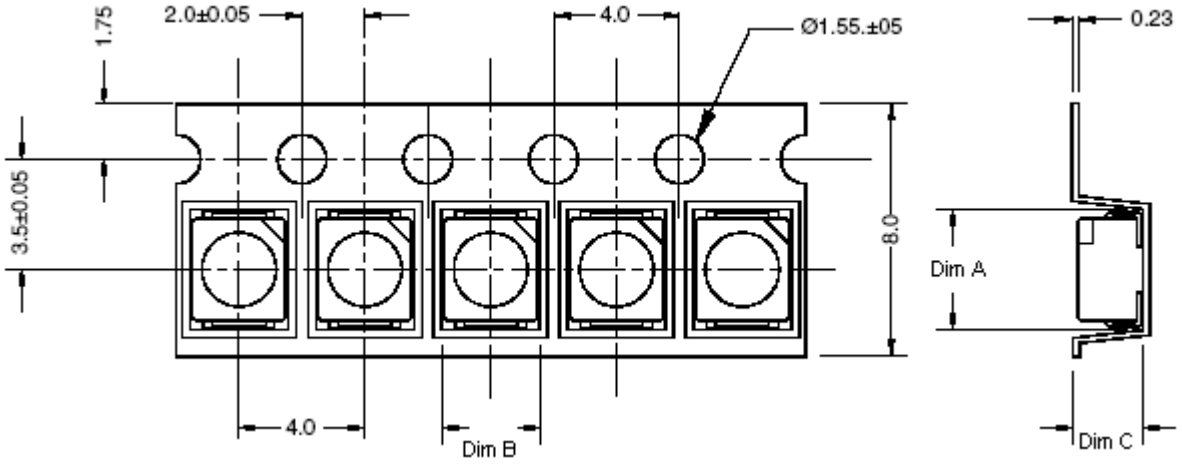


Directive Characteristics



Packaging

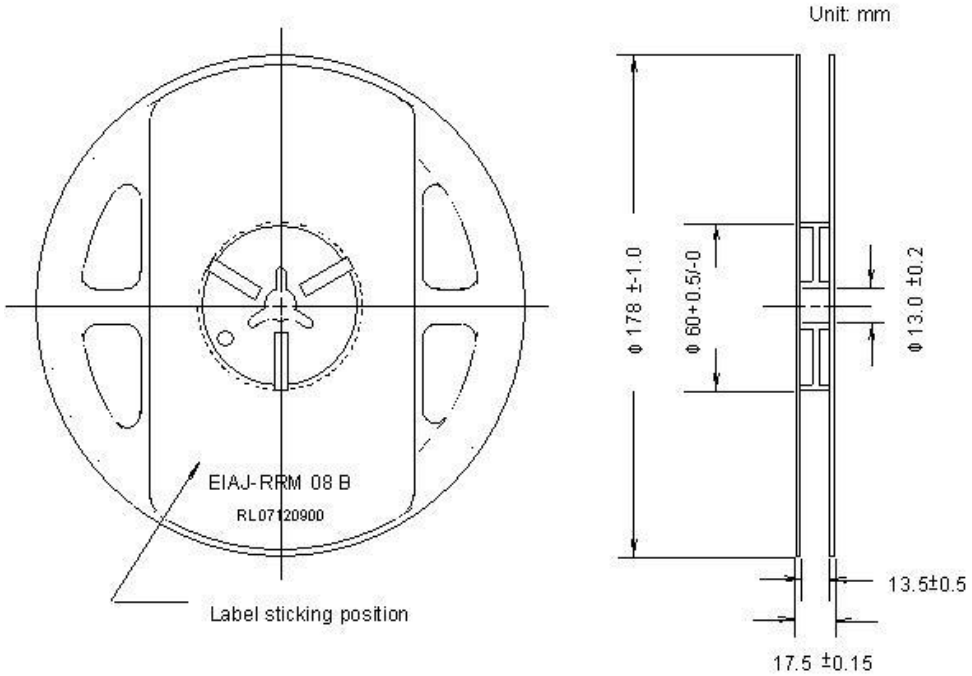
Tape Dimension



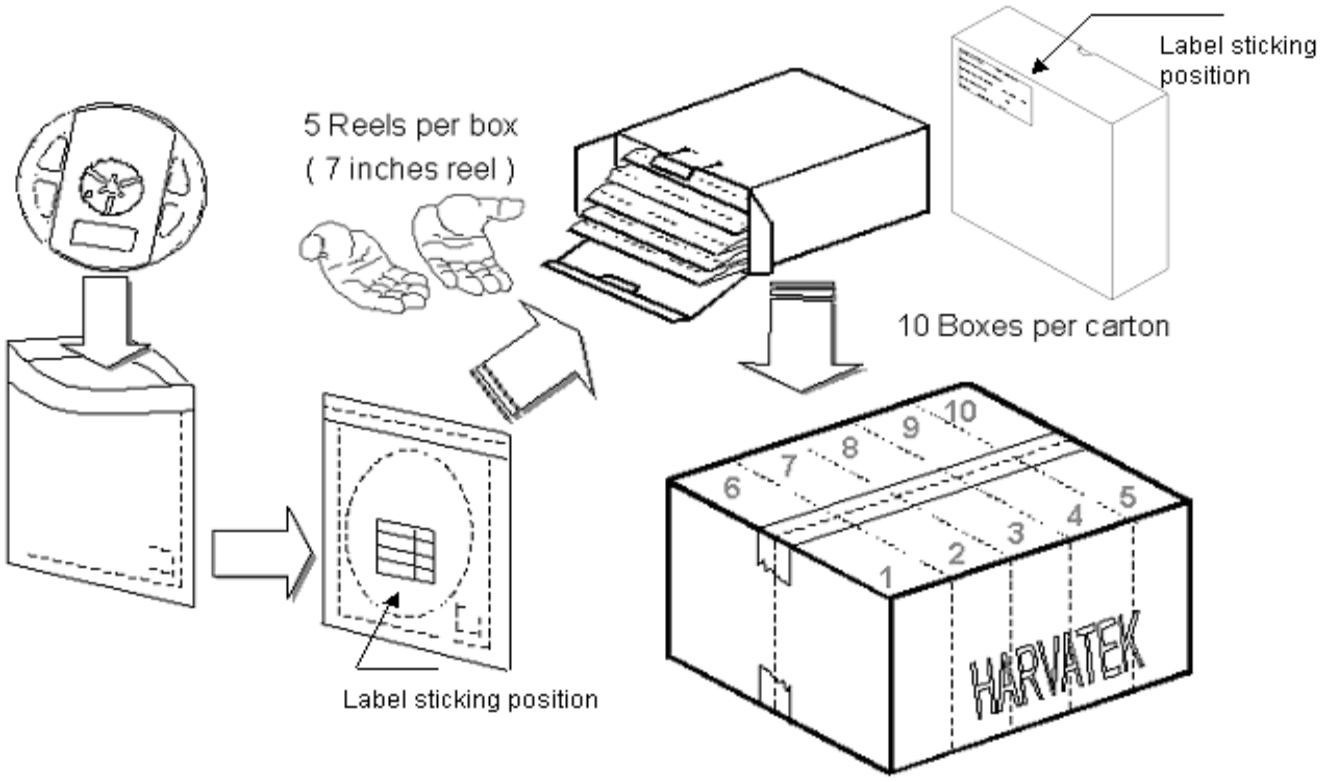
Part No.	Dim. A	Dim. B	Dim. C	Q'ty/Reel
HT-T169	3.73±0.10	2.95±0.10	2.12±0.05	2K

Unit: mm

Reel Dimension



Packing



5 boxes per carton are available depending on shipment quantity.

	Specification	Material	Quantity
Carrier tape	Per EIA 481-1A specs	Plastic tape	2000pcs per reel
Reel	Per EIA 481-1A specs	Plastic white	
Label	HT standard	Paper	
Packing bag	220x240mm	Aluminum laminated bag/ no-zipper	One reel per bag
Carton	HT standard	Paper	Non-specified
Others: Each immediate box consists of 5 reels. The 5 reels may not necessarily have the same lot number or the same bin combinations of Iv, λ_D and Vf. Each reel has a label identifying its specification; the immediate box consists of a product label as well.			

ATTENTION: Electrostatic Discharge (ESD) protection

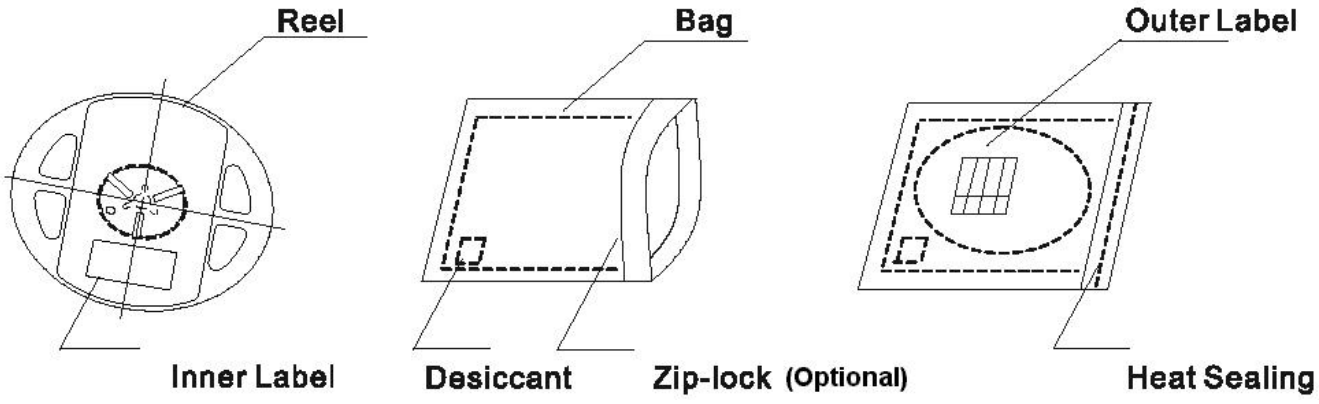
The symbol to the left denotes that ESD precaution is needed. ESD protection for GaP and AlGaAs based chips is necessary even though they are relatively safe in the presence of low static-electric discharge. Parts built with AlInGaP, GaN, or/and InGaN based chips are **STATIC SENSITIVE devices**. ESD precaution must be taken during design and assembly. If manual work or processing is needed, please ensure the device is adequately protected from ESD during the process**.**

Dry Pack

All SMD optical devices are **MOISTURE SENSITIVE**. Avoid exposure to moisture at all times during transportation or storage. Every reel is packaged in a moisture protected anti-static bag. Each bag is properly sealed prior to shipment.

Upon request, a humidity indicator will be included in the moisture protected anti-static bag prior to shipment.

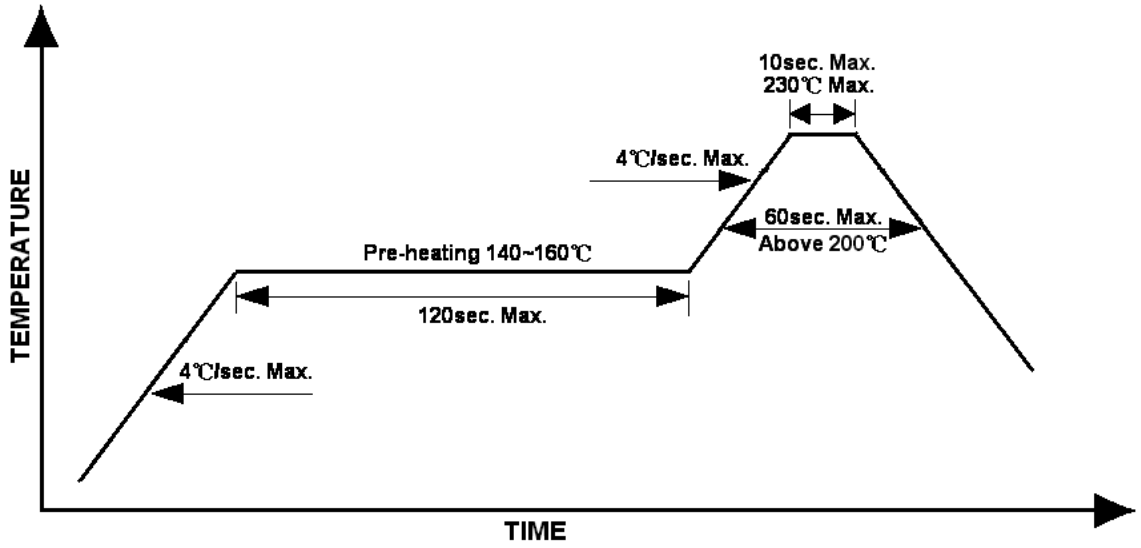
The packaging sequence is as follows:



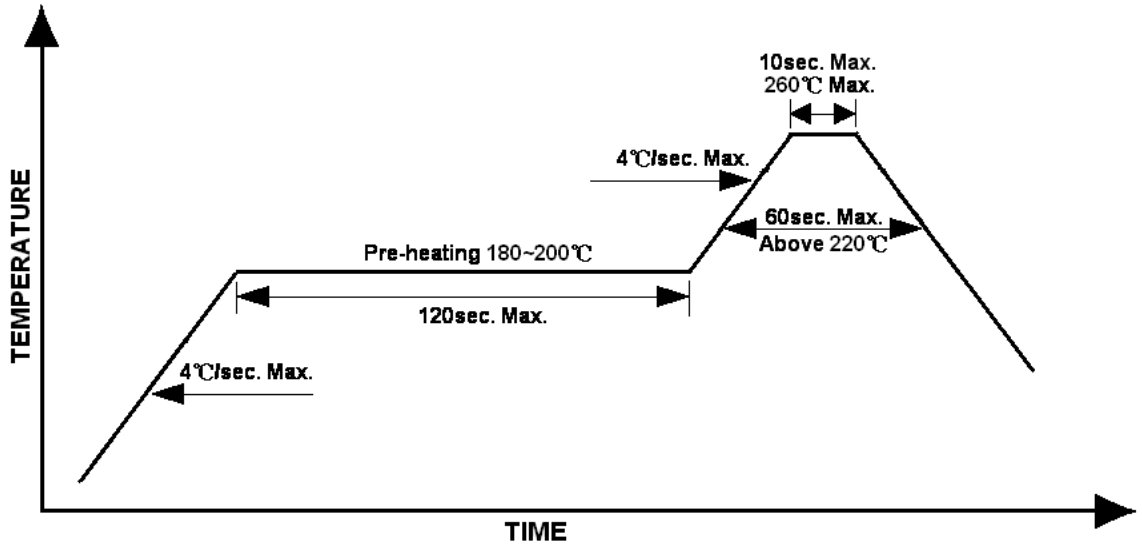
Reflow Soldering

- Recommended tin glue specifications: melting temperature in the range of 178~192 ^{O}C
- The recommended reflow soldering profile is as follows (temperatures indicated are as measured on the surface of the LED resin):

Lead Solder Profile



Lead-free Solder Profile



Precautions

1. Avoid exposure to moisture at all times during transportation or storage.
2. Anti-Static precaution must be taken when handling GaN, InGaN, and AlInGaP products.
3. It is suggested to connect the unit with a current limiting resistor of the proper size. Avoid applying a reverse voltage beyond the specified limit.
4. Avoid operation beyond the limits as specified by the absolute maximum ratings.
5. Avoid direct contact with the surface through which the LED emits light.
6. If possible, assemble the unit in a clean room or dust-free environment.

Reworking

- Rework should be completed within 5 seconds under 260 ^{O}C.
- The iron tip must not come in contact with the copper foil.
- Twin-head type is preferred.

Cleaning

Following are cleaning procedures after soldering:

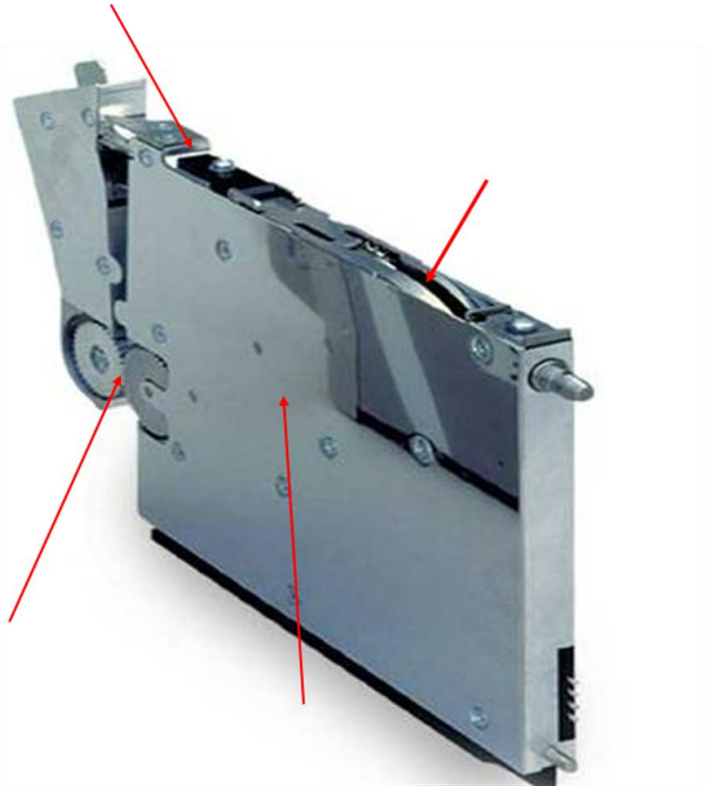
- An alcohol-based solvent such as isopropyl alcohol (IPA) is recommended.
- Temperature x Time should be 50^{o}C x 30sec. or <30^{o}C x 3min
- Ultra sonic cleaning: < 15W/ bath; bath volume ≤ 1liter
- Curing: 100 ^{O}C max, <3min

Cautions of Pick and Place

- Avoid stress on the resin at elevated temperature.
- Avoid rubbing or scraping the resin by any object.
- Electro-static may cause damage to the component. Please ensure that the equipment is properly grounded. Use of an ionizer fan is recommended.

Application Note for Handling of Cover Tape

When cover tape was removed from carrier tape during pick and place process, PSA cover tape adhesive may incur build up on the feeder track, gear or even inside the trash box. (As long as equipment part that has contact with the cover tape during removal process).



1) 3M Adhesive Remover can be used to remove adhesive effectively
2) 3M 5490 PTFE film is recommended to be applied on the part that is in contact with the PSA cover tape adhesive.

PS: For more detail application instruction, 3M requests a close up picture at the feeders portion as indicated with red arrow. Please take picture when the tape is put on with cover tape removal from the tape.

Revision History

Changes since last revision	Page	Version No.	Revision Date
Initial Release - 5607		1.0	09-22-2009
Update luminous intensity (Iv) bin	6	1.1	06-23-2010
Update color temperature rank	6	1.1	06-23-2010
Update Product Specifications	4	1.1	06-23-2010
Update Electro-Optical Characteristics	7	1.1	06-23-2010